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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Wade W. Smith : Art Unit: 3629

Serial No: 10/055,164 : Examiner: Igor N. Borissov

Filed: October 29, 2001 : Docket No: WMS-15

For: Waste Management System

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
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Jean L. Gianfredo

Sir:

REVISED BRIEF ON APPEAL

This is an appeal from the Final rejection of claim 1, dated April 23, 2004 and a response to the Notification of Non-Compliant Appeal Brief dated February 21, 2006. The fee for this brief was paid with the fee for the appeal. Three copies of this brief are enclosed.

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1 Real Party In Interest

Wade W. Smith is the real party in interest.

2 Related Appeals and Interferences

There are no related appeals or interferences.

3 Status of the Claims

This appeal is from the final rejection of claims 1 and 4, dated April 23, 2004. Claim 2 stands allowable if added to claim 1. This brief will deal only with claim 1 which is representative of both claim 1 and claim 4.

(4) Status of Amendments

No amendment has been filed post the final amendment.

(5) Summary of Claimed Subject Matter

It has been established that when people are required to pay for their energy use, the use goes down. As a result, it is a common practice for landlords to monitor the heat use of heat transfer devices in their apartments and to charge tenants for their energy use. Conventionally this is done by measuring the flow at the site of the flow and the temperature at the inlet and outlet of the heat transfer device and computing BTU use from this data.

A system is disclosed in the subject application for monitoring the use of heat energy by a heat transfer device (HTD in figure 1) within an apartment unit. A register/transmitter (R/T in figure 1) is associated with each heat transfer device for receiving pressure and temperature information from a pair of pressure/temperature transducers (P/T in figure 1) located on either side of heat transfer device for supplying temperature and pressure data to the register/transmitter. The register/transmitter periodically multiplies the square root of the change in pressure times the change in temperature from the pressure and temperature data supplied from the pair of pressure/temperature transducers and accumulates this data, This data is sent to a host computer (HC in figure 1) which will compute the BTU's of received accumulated computed square root of the change in pressure times the change in temperature by converting the received data using stored catalog data for the specific heat transfer device identified.

Presented below is claim 1. Applicant first monitors the pressure drop and the temperature drop across the heat transfer device:

''1. A system for monitoring the use of heat energy use of a heat transfer device within an apartment unit comprising

* * *

a pair of pressure/temperature transducers to be connected proximate the upstream and downstream sensing points of a heat

transfer device for supplying temperature and pressure data to said register/transmitter, ...''

Applicant next periodically multiplies the square root of the change in pressure times the change in temperature and accumulates this number in the register/transmitter:

''said register/transmitter including

first computational means for periodically multiplying the square root of the change in pressure times the change in temperature from the pressure and temperature data supplied from said pair of pressure/temperature transducers,

accumulating means for accumulating the computed square root of the change in pressure times the change in temperature,''

This transmitted data does not define the heat use of the heat transfer device. There is a missing piece of information. Producers of heat transfer devices provide catalog data which generally is a chart of pressure drops for a number of flow rates (columns 1 and 2 of Figure 8). This catalog information is provided so that the installer can specify the correct device for a particular job. Since the flow divided by the square root of the change in pressure is a constant (Fig. 8, last column), the accumulated periodically received square root of delta P computations (254.6 in Figure 11) can be converted by the host computer to BTU's by multiplying by 8.33 (BTU's to raise one gallon of water 1 degree F) and by stored catalog data (the flow/square root of P constant (1.41421) for this specific device):

''second computational means for

* * *

computing the BTU's of received accumulated computed square root of the change in pressure times the change in temperature with stored catalog data for the specific heat transfer device identified.''

(6) Grounds Of Rejection To Be Reviewed On Appeal

A. Whether claim 1 is patentable under 35 U.S.C. 103 over Longini (U.S. Pat. No. 4,509,679) in view of Proffitt (U.S. Pat. No. 5,415,024).

(7) Argument

A. BACKGROUND

I. Heat Use Monitoring

a. Prior Art Monitoring Based On Flow

Longini discloses an Energy Use Monitoring System which measures flow and monitors the temperature at either side of the heat transfer device. Saar discloses a System for Billing Individual Units Of A Multi-Unit Building For Water Use And For Water Related Energy Use which also measures flow at the heat transfer device and measures the temperature at either side of the device. Dukelow discloses a Heat Flow Meter and actually determines the flow rate at two locations (7/28) using conventional orifice devices (6/30) (it is an engineering rule that flow rate is a function of the square root of the pressure drop across the orifice) and determines the temperature at two locations (12/36) to acquire data from which energy use can be determined.

B. Prior Art Non Flow Heat Monitoring

Schrock discloses a Heat Apportionment System which measures a single temperature at the heat transfer device. Schrock makes no volume calculation and does not sense pressure.

II. Flow Determination With No Heat Use Monitoring

The examiner has also cited a few patents that do not monitor heat use but do measure flow. Hall discloses a Method And Apparatus For Measuring The Flow Rate Of Compressible Fluids which uses a conventional orifice device which takes pressure and temperature readings on either side of an orifice plate to determine flow ''in accordance with the equation hereinafter developed in the following section on the theory of the (Hall) invention''. Shimada discloses a Multiple-Function Fluid Measuring And Transmitting Apparatus which senses pressure on either side of the orifice plate and takes the temperature on the upstream side of the plate. Proffitt discloses a Composition Analyzer For determining Composition Of Multiphase Multicomponent Fluid Mixture which uses a number of individual flow meters 32/34. Haines discloses a Unitary Fluid Flow Production and Control System where the pressure is read on either side of a valve 36 with individual pressure sensors 40/44. Look up data tells the computer what the flow rate is across the valve for specific read pressures. There is no temperature sensing.

B. THE INVENTION

The inventor herein, follows the architecture of Longini and Saar by defining heat use as the product of flow and temperature change. Where the inventor herein departs from these prior structures is that unlike Longini and Saar which define data at the site which represents the flow rate, the present application, which must have flow data to make the necessary heat use computation does not generate data which defines the flow rate at the point of use. Instead, applicant first monitors the pressure drop and the temperature drop across the heat transfer device:

''1. A system for monitoring the use of heat energy use of a heat transfer device within an apartment unit comprising

* * *

a pair of pressure/temperature transducers to be connected proximate the upstream and downstream sensing points of a heat transfer device for supplying temperature and pressure data to said register/transmitter, ...''

Applicant next periodically multiplies the square root of the change in pressure times the change in temperature and accumulates this number:

''said register/transmitter including

first computational means for periodically multiplying the square root of the change in pressure times the change in temperature from the pressure and temperature data supplied from said pair of pressure/temperature transducers,

accumulating means for accumulating the computed square root of the change in pressure times the change in temperature,''

This transmitted data does not define the heat use of the heat transfer device. There is a missing piece of information. Producers of heat transfer devices provide catalog data which generally is a chart of pressure drops for a number of flow rates (columns 1 and 2 of Figure 8). This catalog information is provided so that the installer can specify the correct device for a particular job. Since the flow divided by the square root of the change in pressure is a constant (Fig. 8, last column), the accumulated periodically received square root of delta P computations (254.6 in Figure 11) can be converted by the host computer to BTU's by multiplying by 8.33 (BTU's to raise one gallon of water 1 degree F) and by stored catalog data (the flow/square root of P constant (1.41421) for this specific device):

''second computational means for

* * *

computing the BTU's of received accumulated computed square root of the change in pressure times the change in temperature with stored catalog data for the specific heat transfer device identified.''

THE REJECTION

The examiner has rejected claim 1 as obvious over Longini in view of Proffitt. First, the prior art is replete with references that determine the flow rate at the heat transfer device and determine the delta T across the heat transfer device whereby heat use can be determined. As already discussed, Longini uses a flow meter to determine flow. Applicant has no idea why Proffitt is relevant to claim 1. Proffitt deals with a multiphase multicomponent fluid mixture. Flow is measured by flow meters 32/34 connected to the inlet and outlet pipes. Temperature data, among other data are used in Proffitt to define the amount of the various components in the multicomponent fluid.

In applicant's claim 1, heat use is not determinable just with the delta T/P information. Unlike Proffitt and Longini, which measure flow at the device, Claim 1 does not measure flow at the device. Claim 1 measures the square root of the change in pressure across the heat transfer device.

No reference teaches first computational means for 1. converting the delta P data into square root of delta P data, 2. accumulating that data times the change in temperature and 3. In a second computer, multiply the accumulated data by catalog data for the specific heat transfer device (the flow/square root of delta P constant determined from the catalog) by the accumulated number to determine heat use (Claim 2, which stands allowable, defines the catalog data as the flow/square root of delta P constant determined from the catalog data and completes the heat use calculation by multiplying this number by 8.33 which is the number of BTU's to raise one gallon of water 1 degree F).

The examiner has no basis for rejecting independent claim 1 (which is representative of claims 1 and 4) should be presently allowed.

Respectfully submitted,

By

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CLAIMS APPENDIX

CLAIMS

1. A system for monitoring the use of heat energy use of a heat transfer device within an apartment unit comprising

a register/transmitter,

a pair of pressure/temperature transducers to be connected proximate the upstream and downstream sensing points of a heat transfer device for supplying temperature and pressure data to said register/transmitter,

said register/transmitter including

first computational means for periodically multiplying the square root of the change in pressure times the change in temperature from the pressure and temperature data supplied from said pair of pressure/temperature transducers,

accumulating means for accumulating the computed square root of the change in pressure times the change in temperature, and

means for periodically transmitting the serial number of the heat transfer device and the accumulated computed square root of the change in pressure times the change in temperature, and

host computer means including

receiver means for receiving the serial number and the accumulated computed square root of the change in pressure times the change in temperature and

second computational means for

identifying the specific heat transfer device and

computing the BTU's of received accumulated computed square root of the change in pressure times the change in temperature with stored catalog data for the specific heat transfer device identified.

2. A system for monitoring the use of heat energy use of a heat transfer device within an apartment unit according to claim 1, wherein said second computational means comprises means for

multiplying the accumulated computed square root of the change in pressure times the change in temperature by

a. the time duration between the periodic multiplying of the square root of the change in pressure times the change in temperature,

b. 8.33, and

c. a constant defined by dividing a flow rate by the square root of the pressure drop across the heat transfer device for that flow rate as defined in the manufacturer's catalogue for that heat transfer device.

3. A system for monitoring the use of heat energy use of a heat transfer device within an apartment unit according to claim 1, wherein said means for periodically transmitting the accumulated computed square root of the change in pressure times the change in temperature additionally transmits the serial number of the heat transfer device and wherein the host computer means receives as inputs the specific type of heat transfer device associated with that serial number and catalog data for that specific type of heat transfer device.

4. A system for monitoring the use of heat energy use of a heat transfer device within an apartment unit comprising

a register/transmitter,

a pair of pressure/temperature transducers to be connected proximate the upstream and downstream sensing points of a heat transfer device for supplying temperature and pressure data to said register/transmitter,

said register/transmitter including

computational means for periodically multiplying the square root of the change in pressure times the change in temperature from the pressure and temperature data supplied from said pair of pressure/temperature transducers, and

accumulating means for accumulating the computed square root of the change in pressure times the change in temperature and

means for periodically transmitting the serial number of the heat transfer device and the accumulated computed square root of the change in pressure times the change in temperature.